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EXAMINER

HOM, SHICK C

ART UNIT PAPER NUMBER

2616

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,591

Applicant(s)

CHEN ET AL.

Examiner

Shick C. Horn

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,7,8,11-18,20-32,34,36-47 and 49-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,8,11-18,20-32,34,36-47 and 49-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-5, 7-8, 11-18, 20-32, 34, 36-47, 49-54 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claims 15-16 are objected to because of the following informalities: In claim 15 line 2, the words "a first code" seems to refer back to the "first code" recited in claim 14 line 2. If this is true, it is suggested changing "a first code" to ---the first code---. Claim 16 is objected to because it depends from claim 15. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. Claims 1-5, 7-8, 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 line 6 and claim 14 line 5 which recite "the encoding" and "said encoding" are not clear as to whether they are reciting the step of encoding bit or the step of encoding

Art Unit: 2616

multiplexed content as in claim 1 lines 3 and 5, and claim 14 lines 2 and 3, respectively. In claim 8 line 4 which recite "a frame decoded" is not clear as to whether it is reciting ---the decoded frame--- of claim 8 line 3 or some other frame. Claims 2-5, 7, and 11-13 are rejected under 35 U.S.C. 112, second paragraph because they depend from rejected claims 1 and 8, respectively.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 7-8, 14, 20, 22, 26, 34, 41, 49, 51-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Haskell et al. (5,159,447).

Regarding claims 1, 14, 26, 34, 41, 49:

Haskell et al. disclose an encoding method for reducing decoding complexity (see col. 12 lines 23-36 which recite the

Art Unit: 2616

technique of simplifying decoding by identifying and extracting data from the multiplexed bit-stream), the method comprising: encoding systematic bits in each of a plurality of buffer with a first code (in Fig. 2, see the encoder buffers 106); multiplexing content of the plurality of buffers (in Fig. 2, see the step of multiplexing content of buffers via MUX switch 108 and multiplex buffer 109); and encoding said multiplexed content with a second code to provide a set of frames, wherein the encoding comprising identifying a block of bits to be encoded and then coding the block of bits with the second or inner code (see col. 3 lines 11-34 which recite the channel interface 80, as shown in Fig. 1, encoding the predetermined bits which results in the output of a second encoded version of the signal to the channel 30 reads on the second code and inner code of claims 1 and 26, respectively).

Regarding claims 7-8, 14, 20, 22, 41, 51-52:

Haskell et al. disclose decoding received frames by a first decoder (in Fig. 1, see the decoder unit 45); de-multiplexing correctly decoded frame to a plurality of buffers, wherein the de-multiplexing comprises identifying a block of bits comprising a frame decoded by the first decoder and belonging to at least one of the plurality of buffers, and further providing the block of bits to at least one of the plurality of buffers; and

Art Unit: 2616

processing content of each of the plurality of buffers (in Fig. 3, see the de-multiplexer switch 203 connected to the decoder buffers 205 and the decoders 208; and see col. 13 line 66 to col. 14 line 11 which recite identifying and selecting packets of data for the associated one of the decoder buffers where they are then decoded whereby an identified packet of data reads on an identified block of bits).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that

Art Unit: 2616

was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 2-5, 11, 15-18, 21, 23, 27-32, 42-47, and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haskell et al. (5,159,447) in view of Naden et al. (6,560,206).

Regarding claims 2-5, 11, 15-18, 21, and 23:

For claims 2-5, 11, 15-18, 21, and 23, Haskell et al. disclose the apparatus and method described in paragraph 5 of this office action. For claims 2-5, 11, 15-18, 21, 23, Haskell et al. disclose all the subject matter of the claimed invention with the exception of wherein said encoding systematic bits in each of a plurality of buffers with an first code comprises: encoding systematic bits in each of the plurality of buffers with a block code as in claims 2, 15; encoding systematic bits in each of the plurality of buffers with a Reed-Solomon code as in claims 3, 16; wherein said multiplexing and de-multiplexing content of the plurality of buffers comprises: providing a block of bits successively from a row of each of the plurality of buffers as in claims 4-5, 17-18, 21; and wherein

Art Unit: 2616

said processing content of each receive buffer comprises:
providing systematic portion of each buffer to higher layers as
in claims 11, 23.

Naden et al. from the same or similar fields of endeavor teach that it is known to encode systematic bits in each of the plurality of buffers with a block code; encode systematic bits in each of the plurality of buffers with a Reed-Solomon code; and encode systematic bits to provide parity bits (see col. 7 line 66 to col. 8 line 49 which recite the use of Reed-Solomon block code and the parity bits); and wherein said multiplexing and de-multiplexing content of the plurality of buffers comprises: providing a block of bits successively from a row of each of the plurality of buffers (see the frame structure in Figs. 3-4); and wherein said processing content of each receive buffer comprises: providing systematic portion of each buffer to higher layers (see col. 10 lines 40-46). Thus, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to encode systematic bits in each of the plurality of buffers with a block code; encode systematic bits in each of the plurality of buffers with a Reed-Solomon code; encode systematic bits to provide parity bits; and wherein said multiplexing and de-multiplexing content of the plurality of buffers comprises: providing a block of bits

Art Unit: 2616

successively from a row of each of the plurality of buffers; and wherein said processing content of each receive buffer comprises: providing systematic portion of each buffer to higher layers as taught by Naden et al. in the apparatus and method of Haskell et al. The encoding systematic bits in each of the plurality of buffers with a block code; with a Reed-Solomon code; and having bits to provide parity bits can be implemented by using the Reed-Solomon block code including the parity bits of Naden et al. in the encoder of Haskell et al. The motivation for encoding systematic bits in each of the plurality of buffers with a block code; with a Reed-Solomon code; and having bits to provide parity bits as taught by Naden et al. in the method and apparatus of Haskell et al. being that it provides more reliable and efficiency for the system since the system can optimize the coding performance.

Regarding claims 27-32, 42-47, and 54:

For claims 27-32, 42-47, ~~51~~, and 54 Haskell et al. disclose the apparatus and method described in paragraph 5 of this office action. For claims 27-32, 42-47, ~~51~~, and 54 Haskell et al. disclose all the subject matter of the claimed invention with the exception of wherein said encoding systematic bits in each of a plurality of buffers with an first code comprises: encoding

Art Unit: 2616

systematic bits in each of the plurality of buffers with a block code as in claims 29, 44; encoding systematic bits in each of the plurality of buffers with a Reed-Solomon code as in claims 30, 45; encode systematic bits to provide parity bits as in claims 27-28 and 42-43; wherein said multiplexing and de-multiplexing content of the plurality of buffers comprises: providing a block of bits successively from a row of each of the plurality of buffers as in claims 31-32, 46-47, ~~54~~, and wherein said processing content of each receive buffer comprises: providing systematic portion of each buffer to higher layers as in claim 54.

Naden et al. from the same or similar fields of endeavor teach that it is known to encode systematic bits in each of the plurality of buffers with a block code; encode systematic bits in each of the plurality of buffers with a Reed-Solomon code; and encode systematic bits to provide parity bits (see col. 7 line 66 to col. 8 line 49 which recite the use of Reed-Solomon block code and the parity bits); and wherein said multiplexing and de-multiplexing content of the plurality of buffers comprises: providing a block of bits successively from a row of each of the plurality of buffers (see the frame structure in Figs. 3-4); and wherein said processing content of each receive buffer comprises: providing systematic portion of each buffer to

Art Unit: 2616

higher layers (see col. 10 lines 40-46). Thus, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to encode systematic bits in each of the plurality of buffers with a block code; encode systematic bits in each of the plurality of buffers with a Reed-Solomon code; encode systematic bits to provide parity bits; and wherein said multiplexing and de-multiplexing content of the plurality of buffers comprises: providing a block of bits successively from a row of each of the plurality of buffers; and wherein said processing content of each receive buffer comprises: providing systematic portion of each buffer to higher layers as taught by Naden et al. in the apparatus and method of Haskell et al. The encoding systematic bits in each of the plurality of buffers with a block code; with a Reed-Solomon code; and having bits to provide parity bits can be implemented by using the Reed-Solomon block code including the parity bits of Naden et al. in the encoder of Haskell et al. The motivation for encoding systematic bits in each of the plurality of buffers with a block code; with a Reed-Solomon code; and having bits to provide parity bits as taught by Naden et al. in the method and apparatus of Haskell et al. being that it provides more reliable and efficiency for the system since the system can optimize the coding performance.

Art Unit: 2616

8. Claims 12, 24, 36-39, 50, 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haskell et al. (5,159,447) in view of Chen et al. (6,052,812).

Regarding claims 12, 24, 36-39, 50, 53:

For claims 12, 24, 36-39, 50, 53, Haskell et al. disclose the apparatus and method described in paragraph 5 of this office action. Haskell et al. disclose all the subject matter of the claimed invention with the exception of providing indication of an erasure to a second decoder communicatively coupled to at least one of the plurality of buffers that would receive the correctly decoded frame if the frame failed to decode correctly as in claims 12, 24, 36, 50, and decode the systematic portion of at least one of the plurality of buffers by an outer decoder when the systematic portion is recoverable as in claims 39, 53.

Chen et al. from the same or similar fields of endeavor teach that it is known to provide an indication of an erasure to a second decoder communicatively coupled to at least one of the plurality of buffers that would receive the correctly decoded frame if the frame failed to decode correctly and decode the systematic portion of at least one of the plurality of buffers by an outer decoder when the systematic portion is recoverable

Art Unit: 2616

(see col. 18 lines 35-51 which recite correcting packets by decoding those packets having the erasure value indicating an error). Thus, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to provide indication of an erasure to a second decoder communicatively coupled to at least one of the plurality of buffers that would receive the correctly decoded frame if the frame failed to decode correctly, and decode the systematic portion of at least one of the plurality of buffers by an outer decoder when the systematic portion is recoverable as taught by Chen et al. in the communications apparatus and method of Haskell et al. The indication of an erasure to a second decoder communicatively coupled to at least one of the plurality of buffers that would receive the correctly decoded frame if the frame failed to decode correctly, and decode the systematic portion of at least one of the plurality of buffers by an outer decoder when the systematic portion is recoverable can be implemented by connecting the outer decoder including indication of an erasure if the frame failed to decode correctly of Chen et al. to the decoder unit of Haskell et al. The motivation for using the outer decode as taught by Chen et al. in the communication apparatus and method of Haskell et al. being that

Art Unit: 2616

it provides more reliability for the system since the system can recover from failed decode at the receiving end.

9. Claims 13, 25, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haskell et al. (5,159,447) and Chen et al. (6,052,812) in view of Naden et al. (6,560,206).

Regarding claims 13, 25, 40:

For claims 13, 25, 40, Haskell et al. and Chen et al. disclose the apparatus and method described in paragraph 8 of this office action. For claims 13, 25, 40 Haskell et al. and Chen et al. disclose all the subject matter of the claimed invention with the exception of wherein said processing content of each receive buffer comprises: providing systematic portion of each buffer to higher layers as in claims 13, 25, 40.

Naden et al. from the same or similar fields of endeavor teach that it is known to provide systematic portion of each buffer to higher layers (see col. 10 lines 40-46). Thus, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to wherein said processing content of each receive buffer comprises: providing systematic portion of each buffer to higher layers as taught by Naden et al. in the apparatus and method of Haskell et al. and

Art Unit: 2616

Chen et al. The step of providing systematic portion of each buffer to higher layers can be implemented by using layer approach of design of Naden et al. in the encoder of Haskell et al. and Chen et al. The motivation for using the layer approach including providing systematic portion of each buffer to higher layers as taught by Naden et al. in the method and apparatus of Haskell et al. and Chen et al. being that it provides more reliable and efficiency for the system since the system is more modular and can be better interfaced and changed.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jeon et al. disclose a method of correcting data on a high-density recording medium.

Kawasaki et al. disclose an apparatus and method for signal separation and recording medium for the same.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shick C. Hom whose telephone number is 571-272-3173. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH SH

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